

River Nore, Kilkenny
Ecological Assessment

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1. INTRODUCTION

Pascal Sweeney was commissioned by Malone O'Regan to conduct an aquatic macroinvertebrate survey of a section of the River Nore in Kilkenny City from upstream of bridge construction works to the weir downstream. The purpose of this survey is to assess possible ecological impacts arising from construction works at the site of a new bridge.

2. METHODOLOGY

2.1 Fieldwork.

Field work was carried out by Pascal Sweeney on 27th November, 2014. At four sites in the River Nore, macroinvertebrate sampling was carried out in accordance with EPA Standard Operating Procedure (Bradley *et al.*, 2014) and the condition of the substratum was observed. Physical conditions recorded are presented in Appendix 1 and photographs are presented in Appendix 2.

2.2 Sample Analysis

Macroinvertebrates were identified to the taxonomic level required for the EPA Q-scheme. At sites where the Q-scheme methodology was applicable, a Q-value was determined based on the abundance of indicator groups and other relevant environmental data, in accordance with the EPA Standard Operating Procedure (Bradley *et al.*, 2014).

3. RESULTS

3.1 Physical Condition of River Substratum.

At Site 1, upstream of the works, the substratum is typical of that which would be expected, given the physical conditions.

The substratum at the works site (Site 2), where stone was taken out on 30/09/14, consists of bare river sand and some remaining stone.

At Site 3, immediately upstream of the weir, where flow is very slack, resulting in depositing conditions, the substratum consists of silt, fine sand, leaf litter and an occasional cobble.

Downstream of the weir, at Site 4, where eroding conditions prevail, the substratum is typical of that which would be expected, with no siltation.

3.2 Macroinvertebrate Community Analysis.

Macroinvertebrate results are presented in Appendix 3.

Site 1. While the fauna of this eroding site is dominated by EPA Indicator Group C (Relatively Pollution Tolerant), two species of flat mayfly from Group A (Very Pollution Sensitive) are common. Groups D (Very Pollution Tolerant) and E (Most Pollution Tolerant) are present in low numbers.

The good representation of Group A taxa in a fauna dominated by Group C, with little representation of Groups D and E, indicates a Q-value of **Q4**.

Site 2. The fauna is quite sparse, with only the freshwater shrimp (*Gammarus sp.*) and non-biting midges (Chironomidae) well represented. Due to the recent disturbance of the substratum and the fauna found, this site is considered to be currently recolonising and is therefore unsuitable for assessment by the Q-scheme methodology.

Site 3. The fauna of this site is typical of slack, silted conditions, with decaying organic debris. It is unsuitable for assessment by the Q-scheme methodology.

Site 4. As at Site 1, the fauna of this eroding site is dominated by Indicator Group C, with two species of flat mayfly from Group A common in occurrence. Group D is poorly represented and Group E is absent.

The good representation of Group A taxa in a fauna dominated by Group C, with little representation of Group D and Group E absent, indicates a Q-value of **Q4**.

4. CONCLUSIONS

The works in the River Nore have resulted in a relatively small area at the site being denuded of natural substratum. This is now being re-colonised by macroinvertebrates.

It is not possible to determine to what extent silt generated by the works contributed to the silted substratum in the slack water immediately upstream of the weir. However, it must be borne in mind that conditions here would not be suitable for most protected aquatic species, apart from lamprey ammocoetes, for which a small amount of additional siltation would not be problematic.

Downstream of the weir, silt is absent from the substratum and the macroinvertebrate faunal composition does not show any indication of a siltation impact. The river here is at Q4, the same as upstream of the works. This indicates that any silt generated had only a temporary impact here. High flows in the River Nore in mid-November (see Appendix 4) would, presumably, have flushed silt deposits near the site of the works to more depositing locations farther downstream.

APPENDIX 1 RIVER NORE SAMPLING SITE DETAILS

Site Code	1
GPS Reading	S50517 56563
Location	Upstream of Green's Br.
Photograph No.	1
Sampling depth (m)	0.7
Flow	Riffle: 50% Glide/Run: 50%
Substrate	1. Cobble 2. Gravel
Instream Vegetation	<i>Ranunculus sp.</i> 5% <i>Fontinalis antipyretica</i> 5%

Site Code	2
GPS Reading	S50598 56412
Location	At works site
Photograph No.	2
Sampling depth (m)	0.7
Flow	Glide: 100%
Substrate	1. Limestone Cobble 2. Sand
Instream Vegetation	None

Site Code	3
GPS Reading	S51120 55788
Location	Immediately upstream of weir
Photograph No.	3
Sampling depth (m)	0.5
Flow	Fast Glide/Run: 100%
Substrate	1. Silt 2. Fine Sand 3. Leaf Litter
Instream Vegetation	<i>Sparganium emersum</i> <5%

Site Code	4
GPS Reading	S51040 55815
Location	Immediately downstream of weir
Photograph No.	4
Sampling depth (m)	0.7
Flow	Riffle: 50% Run: 50%
Substrate	1. Cobble 2. Gravel 3. Boulder
Instream Vegetation	<i>Ranunculus sp.</i> <5%

APPENDIX 2
PHOTOGRAPHS OF SAMPLING SITES

Photo 1: Site 1, Upstream of Green's Bridge



Photo 2: Site 2, At Construction Site



Photo 3: Site 3, Upstream of Weir



Photo 4: Site 4, Downstream of Weir



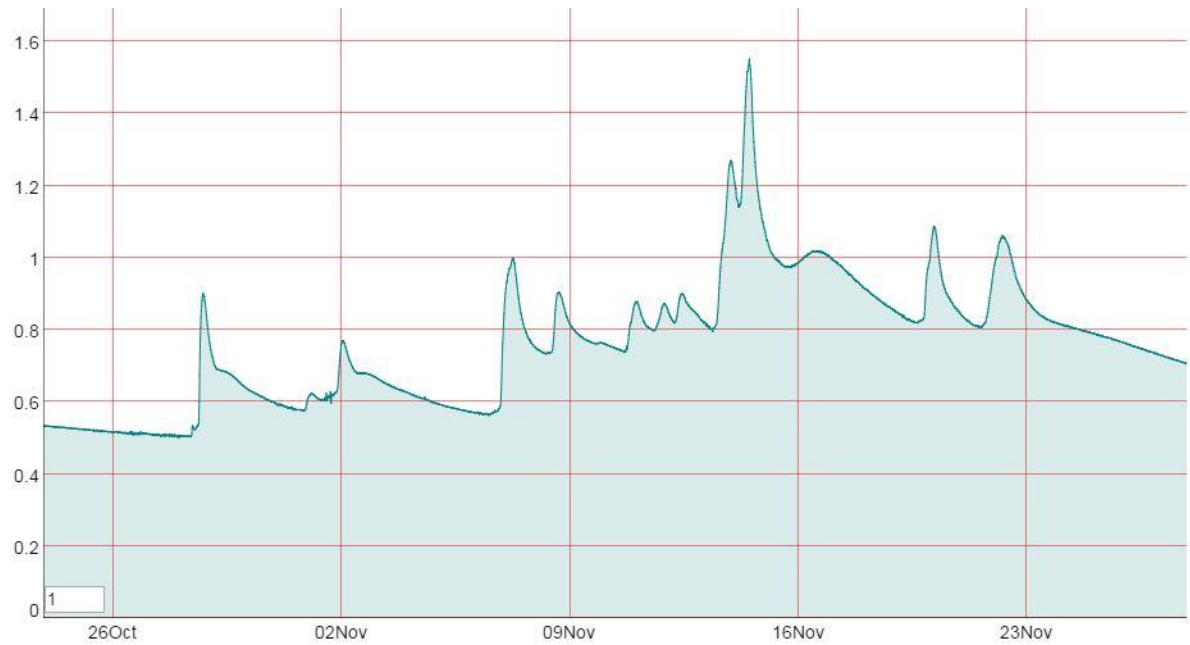
APPENDIX 3 Macroinvertebrate Community Composition

Relative abundance expressed as D: Dominant; N: Numerous; C: Common; F: Few; SS: Single Specimen

TAXON	SITE 1	SITE 2	SITE 3	SITE 4
EPA Group A (Sensitive)				
<i>Ecdyonurus sp.</i>	C	SS		C
<i>Heptagenia sp.</i>	C			C
EPA Group B (Less Sensitive)				
Glossosomatidae		SS		
Leptoceridae				SS
Sericostomatidae		SS		F
EPA Group C (Relatively Tolerant)				
<i>Piscicola geometra</i>				SS
<i>Valvata piscinalis</i>			F	
<i>Potamopyrgus antipodarum</i>	F	SS		
<i>Gammarus sp.</i>	N	N		N
<i>Baetis rhodani</i>				F
<i>Caenis sp.</i>	F			F
Hydropsychidae	F			
Rhyacophilidae	F			
Polycentropodidae		SS		
Haliplidae		F	F	SS
Gyrinidae				SS
<i>Tipula sp.</i>	SS	SS		SS
Simuliidae	C			
Chironomidae (ex. <i>Chironomus</i>)	N	N	D	C
EPA Group D (Very Tolerant)				
<i>Pisidium sp.</i>			C	SS
<i>Radix balthica</i>				
Glossiphonidae	F			F
<i>Erpobdella sp.</i>	SS			
<i>Asellus aquaticus</i>			SS	SS
EPA Group E (Most Tolerant)				
Tubificidae	F		N	
<i>Chironomus sp.</i>			C	
Not assigned to any group				
Lumbriculidae				F
Ceratopogonidae		SS	F	

APPENDIX 4 WATER LEVELS IN RIVER NORE AT JOHN'S BRIDGE

(from OPW website)



APPENDIX 5 REFERENCES

Bradley, C., Lucey, J., McGarrigle, M. and McCreesh, P. (2014). Standard Operating Procedure for River Biological Monitoring Field Sampling Surveys. EPA.